## 1 Identification of the substance/mixture and the company/undertaking

### 1.1 Product identifier
- **Trade name:** Armor-Hard (Part A)

### 1.2 Application of the substance / the mixture: Epoxy binder

### 1.3 Details of the supplier of the Safety Data Sheet
- **Manufacturer/Supplier:**
  - Metzger/McGuire Co.
  - P. O. Box 2217
  - Concord, NH 03302
  - Telephone: (800) 223-6680

### 1.4 Emergency telephone number:
- **ChemTel Inc.**
  - (800) 255-3924, +1 (813) 248-0585

## 2 Hazards identification

### 2.1 GHS Classification of the substance or mixture
- **Eye Irritant:** H319: Causes serious eye irritation.
- **Skin Irritant:** H315: Causes skin irritation.
- **Skin Sensitizer:** H317: May cause and allergic skin reaction.

### 2.2 GHS Label elements
- **Hazard pictograms/symbols:**
  - **Signal word:** Warning
  - **Hazard statements:**
    - H315: Causes skin irritation.
    - H319: Causes serious eye irritation.
    - H317: May cause and allergic skin reaction.

## 3 Composition/information on ingredients

### 3.2 Mixture
- **Description:** Mixture of substances listed below with nonhazardous additions.

#### Dangerous components:
- **CAS:** 25068-93-6
  - **Trade Secret:** Glycidyl ether
  - **Reaction product:** bisphenol-A (epichlorhydrin) epoxy resin (number average molecular weight < 700)
  - **Composition:** 60-70%

### 4 First aid measures

#### 4.1 Description of first aid measures
- **General information:** Immediately remove any clothing soiled by the product. Symptoms of poisoning may even occur several hours after contact. Take affected persons out into the fresh air. After inhalation: Supply fresh air; consult doctor in case of complaints. After skin contact: Immediately rinse with water. If skin irritation continues, consult a doctor. After eye contact: Remove contact lenses if worn, if possible. Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor. After swallowing: Rinse out mouth and then drink plenty of water. Do not Induce vomiting; call for medical help immediately.

### 5 Firefighting measures

#### 5.1 Extinguishing media
- **Suitable extinguishing agents:** Water, Foam, Fire-extinguishing powder, Carbon dioxide.
- **For safety reasons unsuitable extinguishing agents:** Water with full jet, Water spray

#### 5.2 Special hazards arising from the substance or mixture
- **Formation of toxic gases is possible during heating or in case of fire.**

#### 5.3 Advice for the firefighters
- **Protective equipment:** Wear self-contained respiratory protective device, Wear fully protective suit.

### 6 Accidental release measures

#### 6.1 Personal precautions, protective equipment and emergency procedures
- **Use only in well-ventilated areas.** Use respiratory protective device against the effects of fumes/dust/aerosol. Wear protective equipment. Keep unprotected persons away. Ensure adequate ventilation. Keep away from ignition sources.

#### 6.2 Environmental precautions
- **Do not enter sewers' surface or ground water.** Inform respective authorities in case of seepage into water course or sewage system. Prevent from spreading (e.g. by damming–in or oil barriers).

### 6.3 Methods and material for containment and cleaning up
- **Absorb liquid components with liquid-binding material.** Send for recovery or disposal in suitable receptacles. Dispose contaminated material as waste according to item 13. Ensure adequate ventilation.

## 7 Handling and storage

### 7.1 Precautions for safe handling
- **Use only in well-ventilated areas.** Store in cool, dry place in tightly closed receptacles (60-80°F recommended).

### 7.2 Conditions for safe storage, including any incompatibilities
- **Use only receptacles specifically permitted for this substance/product.** Avoid storage near extreme heat, ignition sources or open flame.

### Further Information about storage conditions
- **Keep container tightly sealed.** Store in an area with adequate ventilation.
8 Exposure controls/personal protection

8.1 Control parameters
Ingredients with limit values that require monitoring at the workplace: The product does not contain any relevant quantities of materials with critical values that have to be monitored at the workplace.
DNECs: No further relevant information available.
PNECs: No further relevant information available.
Additional information: The lists valid during the making were used as basis.

8.2 Engineering controls
Provide readily accessible eye wash stations and safety showers. Provide ventilation adequate to ensure concentrations are minimized.

8.3 Personal protective equipment

General protective and hygienic measures: Keep away from foodstuffs, beverages and feed. Immediately remove all soiled and contaminated clothing. Wash hands before breaks and at the end of work. Do not inhale gases / fumes / aerosols.
Avoid contact with the eyes and skin.
Respiratory protection: Not required under normal conditions of use. Use suitable respiratory protective device in case of insufficient ventilation. For spills, respiratory protection may be advisable.

Hand protection: Protective, impervious gloves. (Neoprene, PVC, Nitrile rubber) The glove material has to be impermeable and resistant to the product / the substance / the preparation. Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation.

Skin and Body protection: Protective work clothing. Where potential exposure warrants, rubber or plastic boots and chemically resistant protective suit.

9 Physical and chemical properties

9.1 Information on basic physical and chemical properties

General Information

Appearance
Form: Liquid
Colour: Colourless
Odour: Sweet
Odour threshold: No data available
pH: No data available
Melting point/range: No data available
Boiling point/range: >382 °F / >200 °C
Flash point: >302 °F / >150 °C
Evaporation rate: No data available
Flammability (solid, gaseous): Not applicable
Upper/lower flammability or explosive limit: Not applicable
Vapor pressure: No data available
Vapor density: No data available
Relative Density at 20°C: 1.12g/cm³
Solubility in / Miscibility with: Water: Not miscible or difficult to mix.
Partition coefficient (n-octanol/water): No data available
Auto/Self-ignition temperature: No data available
Decomposition temperature: No data available
Viscosity 900 – 1,400 cps

10 Stability and reactivity

10.1 Reactivity
10.2 Chemical stability
Thermal decomposition / conditions to be avoided: No decomposition if used and stored according to specifications.

11 Toxicological information

11.1 Information on likely routes of exposure:

Inhalation: May cause respiratory irritation
Ingestion: No data
Skin contact: May cause skin irritation
Eye contact: May cause eye irritation

11.2 Symptoms related to physical, chemical and toxicological characteristics: No available data

11.3 Delayed and immediate effects as well as chronic effects from short and long-term exposure:

(Data for primary component, Reaction product: bisphenol - A- (epichlorhydrin) epoxy resin)
Acute toxic:
Oral LD50 > 2,000 mg/kg (rat)
Dermal LD50 > 2,000 mg/kg (rat)
Inhalation No data

Skin Corrosive/irritant: Test material was slightly irritating to skin in key studies. For the skin, mean erythema and edema scores were 0.8 and 0.5 respectively. Serious eye damage/eye irritation: Test material was slightly irritating to the eye in key studies. The mean eye score was 0.4
Respiratory sensitization: No data available
Skin sensitization: In a local lymph node assay, the concentration that would cause a 3-fold increase in proliferation (EC3) was calculated to be 5.7% which is consistent with moderate dermal sensitization potential.

11.4 Numerical measures of toxicity: No data available for mixture.

Additional toxicological information: The product shows the following dangers according to the calculation method of the General EU. Classification Guidelines for Preparations as issued in the latest version: Irritant, Danger through skin absorption. Toxic and/or corrosive effects may be delayed up to 24 hours. Inhalation of concentrated vapours as well as oral intake will lead to anesthesia-like conditions and headache, dizziness, etc.

12 Ecological information

12.1 Toxicity

Aqueous toxicity:
(Data taken from SDS of primary component, Reaction product: bisphenol - A- (epichlorhydrin) epoxy resin)
Fish
96h-LC50 = 3.6mg/L test mat. Oncorhynchus mykiss
(direct application, nominal) (OECD Guideline 203)
LC50 1,41 mg/L 96h Orzieszia latipes
(direct application, nominal) (OECD Guideline 203)
Crustacea
48h-EC50 = 2.9mg/L test mat Daphnia magna
(direct application, nominal, based on: mobility) (OECD Guideline 202)
EC50 1.7mg/L 48hr
Aquatic Plant
72hr-EC50 > 11 mg/L Scenedesmus capricornutum
Based on: growth rate (EPA-660/3-75-009)

12.2 Persistence and degradability: No data available.
12.3 Bioaccumulative potential: No further relevant information available.
12.4 Mobility in soil: No further relevant information available.
12.5 Results of PBT and vPvB assessment:
PBT: Not applicable.
vPvB: Not applicable.
12.6 Other adverse effects: No further relevant information available.

10.4 Conditions to avoid: Avoid contact with strong oxidizing agents, excessive heat or flames.
10.5 Incompatible materials: Strong acids, bases and oxidizing agents.
10.6 Hazardous decomposition products: Carbon monoxide and carbon dioxide.
13 Disposal considerations

13.1 Waste treatment methods
Waste from residue/unused product: This product should not be allowed to enter drains, water courses or the soil. Dispose of this material in a safe manner and in accordance with federal, state and local regulations.
Contaminated packaging: Disposal must be made in accordance with official federal, state and local regulations.

14 Transport information

DOT
UN number: Not Regulated

IATA
UN number: Not Regulated

IMDG
UN number: Not Regulated

TDG
UN number: Not Regulated

15 Regulatory Information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture
United States (USA)
SARA
Section 313 ( Extremely hazardous substances): None of the ingredients is listed.
Section 311 (Specific toxic chemical listings):
Component(s) above 'de minimus' level: None
TSCA (Toxic Substances Control Act):
All the ingredients are listed.
Proposition 65 (California):
Chemicals known to cause cancer: None

Canada
Canadian Domestic Substances List (DSL): All ingredients are listed.
Canadian Ingredient Disclosure list (limit 0.1%): None of the ingredients is listed.
Canadian Ingredient Disclosure list (limit 1%): None of the ingredients is listed.

15.2 Chemical Safety assessment: A Chemical Safety Assessment has not been carried out.

16 Other information
This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

Abbreviation and acronyms:
ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road
IMDG: International Maritime Code for Dangerous Goods
1 Identification of the substance/mixture and the company/undertaking

1.1 Product identifier
Trade name: Armor-Hard (Part B)

1.2 Application of the substance / the mixture: Epoxy binder

1.3 Details of the supplier of the Safety Data Sheet
Manufacturer/Supplier: Metzger/McGuire Co.
P. O. Box 2217
Concord, NH 03302
Telephone: (800) 223-6680

1.4 Emergency telephone number:
ChemTel Inc.
(800) 255-3924, +1 (813) 248-0585

2 Hazards identification

2.1 GHS Classification of the substance or mixture
Acute Toxicity – Oral; Category 4
Acute Toxicity – Dermal; Category 4
Skin Corrosion; Category 1B
Serious Eye Damage; Category 1
Skin Sensitization; Category 1
Reproductive Toxicity; Category 2
Specific Target Organ Toxicity – single exposure; Category 3

2.2 GHS Label elements
Hazard pictograms/symbols

Signal word: Danger

Hazard statements:
H302+H312: Harmful if swallowed or in contact with skin.
H314: Causes severe skin burns and eye damage.
H317: May cause an allergic skin reaction.
H318: Causes serious eye damage.
H335: May cause respiratory irritation.
H315: May cause fertility or the unborn child.
H360: May cause respiratory irritations.

Precautionary statements:
P201: Obtain special instructions before use.
P256: Do not breathe dust/fumes/gas/mist/vapours/spray.
P264: Wash hands thoroughly after handling.
P271: Use only outdoors or in a well-ventilated area.
P266: Wear protective gloves/protective clothing/eye protection/face protection.
P281: Use personal protective equipment as required

P301+P330+P331: IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303+P361+P353: IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310: Immediately call a POISON CENTRE or doctor/physician.
P403+P233: Store in a well-ventilated place. Keep container tightly closed.

Additional information: This product contains a component that is toxic by inhalation when aerosolized or sprayed. Please refer to Sections 11 for toxicity information. If product is not being aerosolized or sprayed, the inhalation toxicity may not be applicable.

3 Composition/information on ingredients

3.1 Mixture
Description: Mixture of substances listed below with potential nonhazardous additions.

Dangerous components:
CAS: 111-40-5
Trade Secret
Modified Polyamide
20-40%

CAS: 80-05-7
Phenol, 4,4’-(1-methylethylene)bis-
20-40%

In conformity with 29CFR 1910.1200(i) the specific chemical identity may be withheld as Trade Secret, while all health/safety properties and effects are included in the SDS.

4 First aid measures

4.1 Description of first aid measures
General information: Seek medical advice. If breathing has stopped or is labored, give assisted respirations. Supplemental oxygen may be indicated. If the heart has stopped, trained personnel should begin cardiopulmonary resuscitation immediately.

After inhalation: Supply fresh air; consult doctor in case of complaints.

After skin contact: Immediately remove contaminated clothing, and any extraneous chemical, if possible to do so without delay. Take off contaminated clothing and shoes immediately.

After eye contact: Rinse immediately with plenty of water for at least 15 minutes. If symptoms persist, consult a doctor.

After ingestion: Never give anything by mouth to an unconscious person. Prevent aspiration of vomit. Turn victim's head to the side. Do not Induce vomiting; call for medical help immediately.

4.2 Most important symptoms and effects, both acute and delayed: Repeated and/or prolonged exposures to low concentrations of vapors or aerosols may cause: sore throat, asthma, eye disease, kidney disorders, liver disorders, skin disorders and allergies.

4.3 Indication of any immediate medical attention and special treatment needed: Contains Phenol, 4,4’-(1-methylethylene)bis- May cause an allergic reaction.

5 Firefighting measures

5.1 Extinguishing media
Suitable extinguishing agents: Foam, Fire-extinguishing powder, Carbon dioxide.

5.2 Specific hazards arising from the substance or mixture: May generate ammonia gas. May generate toxic nitrogen oxide gases. Burning produces noxious and toxic fumes. Downwind personnel must be evacuated.

5.3 Advice for the firefighters
Protective equipment: Wear self-contained respiratory protective device, Wear fully protective suit.

Additional information: Cool endangered receptacles with water fog or haze. Eliminate all ignition sources if safe to do so.

6 Accidental release measures


6.2 Environmental precautions: Do not allow to enter sewers/surface or ground water. Inform respective authorities in case of seepage into water course or sewage system. Prevent from spreading (e.g. by damming-in or oil barriers).

6.3 Methods and material for containment and cleaning up: Send for recovery or disposal in suitable receptacles. Dispose contaminated material as waste according to item 13. Ensure adequate ventilation.
7 Handling and storage

7.1 Precautions for safe handling: Use only in well-ventilated areas, Store in cool, dry place in tightly closed receptacles (60-80°F recommended).

7.2 Conditions for safe storage, including any incompatibilities: Use only receptacles specifically permitted for this substance/product. Avoid storage near extreme heat, ignition sources or open flame.

Further information about storage conditions: Keep container tightly sealed. Store in an area with adequate ventilation.

8 Exposure controls/personal protection

8.1 Control parameters

<table>
<thead>
<tr>
<th>Substance</th>
<th>Exposure Limit (REL)</th>
<th>Time Weighted Average (TWA) Value</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diethyleneetriamine</td>
<td>1 ppm</td>
<td>1 ppm</td>
<td></td>
</tr>
<tr>
<td>Diethyleneetriamine</td>
<td>Recommended Exposure Limit (REL): NIOSH</td>
<td>1 ppm</td>
<td>4 mg/m³</td>
</tr>
<tr>
<td>Diethyleneetriamine</td>
<td>Time Weighted Average (TWA):OSHA TLV</td>
<td>1 ppm</td>
<td>4 mg/m³</td>
</tr>
<tr>
<td>Diethyleneetriamine</td>
<td>Time Weighted Average (TWA): Permissible Exposure Limit (PEL): US CA OEL</td>
<td>1 ppm</td>
<td>4 mg/m³</td>
</tr>
<tr>
<td>Diethyleneetriamine</td>
<td>Time Weighted Average (TWA): TN OEL</td>
<td>1 ppm</td>
<td>4 mg/m³</td>
</tr>
<tr>
<td>Benzyl alcohol</td>
<td>Time Weighted Average (TWA): WEEL</td>
<td>10 ppm</td>
<td>44.20 mg/m³</td>
</tr>
</tbody>
</table>

8.2 Engineering controls

Provide readily accessible eye wash stations and safety showers. Provide ventilation adequate to ensure concentrations are minimized.

8.3 Personal protective equipment

General protective and hygienic measures: Keep away from foodstuffs, beverages and feed. Immediately remove all soiled and contaminated clothing. Wash hands before breaks and at the end of work. Do not inhale gases / fumes / aerosols. Avoid contact with the eyes and skin.

Respiratory protection: Not required under normal conditions of use. Use suitable respiratory protective device in case of insufficient ventilation. For spills, respiratory protection may be advisable. Use respiratory protection when grinding or cutting material.

Hand protection: Protective, impervious gloves. (Neoprene, Butyl-rubber, Nitrile rubber)

Eye protection: Face shield with safety glasses or goggles underneath. Contact lenses should not be worn.

Skin and Body protection: Protective work clothing. Where potential exposure warrants, rubber or plastic boots and chemically resistant protective suit.

9 Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance: Liquid

Colour: Amber

Odour: Amine

pH: Alkaline

Melting point/range: Not data available

Boiling point/range: >350 °F / >176 °C

Flash point: >212 °F / >100 °C

Evaporation rate: No data available

Flammability (solid, gaseous): Not applicable

Upper/lower flammability or explosive limit: Not applicable

Vapor pressure: No data available

Vapor density: No data available

Relative Density at 20°C: 1.01g/cm³

Solubility in / Miscibility with: Not miscible or difficult to mix.

Partition coefficient (n-octanol/water): Not data available

10 Stability and reactivity

10.1 Reactivity

10.2 Chemical stability

Thermal decomposition / conditions to be avoided: No decomposition if used and stored according to specifications.

10.3 Possibility of hazardous reactions: Reacts with strong alkali, Exothermic polymerization, Reacts with strong acids and oxidizing agents, Reacts with catalysts.

10.4 Conditions to avoid: Avoid contact with strong oxidizing agents, excessive heat or flames.

10.5 Incompatible materials: Strong acids, bases and oxidizing agents.

10.6 Hazardous decomposition products: Nitric acid, Ammonia, Nitrogen oxides (NOx), Nitrogen oxide can react with water vapors to form corrosive nitric acid, Carbon monoxide, Carbon dioxide (CO2), Aldehydes, Flammable hydrocarbon fragments.

11 Toxicological information

11.1 Information on likely routes of exposure:

Skin contact: Harmful in contact with skin. Causes skin burns.

Eye contact: Causes eye burns.

Ingestion: Harmful if swallowed. If ingested, severe burns of the mouth and throat, as well as a danger of perforation of the esophagus and the stomach.

Inhalation: This product contains a component that is toxic by inhalation when aerosolized or sprayed. If product is not being aerosolized or sprayed, the inhalation toxicity may not be applicable. Inhalation of vapors and/or aerosols in high concentration may cause irritation of respiratory system. Inhalation of aerosols may cause irritation to the upper respiratory tract. May cause nose, throat, and lung irritation. Can cause severe eye, skin and respiratory tract burns.

11.2 Symptoms related to physical, chemical and toxicological characteristics: Repeated and/or prolonged exposures to low concentrations of vapors or aerosols may cause: sore throat, asthma, eye disease, kidney disorders, liver disorders, skin disorders and allergies.

11.3 Delayed and immediate effects as well as chronic effects from short and long-term exposure: This product contains no listed carcinogens according to IARC, ACGIH, NTP and/or OSHA in concentrations of 0.1 percent or greater. May cause allergic skin reaction. This product may cause adverse reproductive effects. Asthma, Eye disease, Kidney disorders, Liver disorders, Skin disorders and Allergies.

11.4 Numerical measures of toxicity: No data is available for full mixture.

<table>
<thead>
<tr>
<th>Substance</th>
<th>CAS Number</th>
<th>Oral LD50</th>
<th>Dermal LD50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diethyleneetriamine</td>
<td>CAS 111-40-0</td>
<td>1080 mg/kg (rat)</td>
<td>1090 mg/kg (rabbit)</td>
</tr>
<tr>
<td>Phenol, 4,4’-[(1- methylphenylethylene)bis-</td>
<td>CAS 80-05-7</td>
<td>3250 mg/kg (rat)</td>
<td>3000 mg/kg (rabbit)</td>
</tr>
</tbody>
</table>

12 Ecological information

12.1 Aquatic toxicity: No data available on the product itself.

Toxicity to fish – Components

<table>
<thead>
<tr>
<th>Substance</th>
<th>LC50 (96 h)</th>
<th>LC50 (96 h)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benzyl alcohol</td>
<td>10 mg/l</td>
<td>460 mg/l</td>
</tr>
<tr>
<td>Species: Bluegill sunfish</td>
<td>Lepomis macrochirus</td>
<td></td>
</tr>
<tr>
<td>Benzyl alcohol</td>
<td>10 mg/l</td>
<td>460 mg/l</td>
</tr>
<tr>
<td>Species: Fathead minnow</td>
<td>Pimephales promelas</td>
<td></td>
</tr>
</tbody>
</table>

12.2 Persistence and degradability: No data available.

12.3 Bioaccumulative potential: No data available on the product itself.

12.4 Mobility in soil: No data available.

12.5 Other adverse effects: No further relevant information available.
13 Disposal considerations

13.1 Waste treatment methods
Waste from residue/unused product: This product should not be allowed to enter drains, water courses or the soil. Dispose of this material in a safe manner and in accordance with federal, state and local regulations.

14 Transport information

DOT
UN number: UN2735
Proper Shipping Name: AMINES, LIQUID, CORROSIVE, N.O.S. (Diethylenetriamine, Polyamide)
Hazard Class: 8
Packing Group: II
Labels(s): 8
Marine Pollutant: No

IATA
UN number: UN2735
Proper Shipping Name: AMINES, LIQUID, CORROSIVE, N.O.S. (Diethylenetriamine, Polyamide)
Hazard Class: 8
Packing Group: II
Labels(s): 8
Marine Pollutant: No

IMDG
UN number: UN2735
Proper Shipping Name: AMINES, LIQUID, CORROSIVE, N.O.S. (Diethylenetriamine, Polyamide)
Hazard Class: 8
Packing Group: II
Labels(s): 8
Marine Pollutant: No

TDG
UN number: UN2735
Proper Shipping Name: AMINES, LIQUID, CORROSIVE, N.O.S. (Diethylenetriamine, Polyamide)
Hazard Class: 8
Packing Group: II
Labels(s): 8
Marine Pollutant: No

15 Regulatory Information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

Toxic Substance Control Act (TSCA) 12(b) Component(s): None.

<table>
<thead>
<tr>
<th>Country</th>
<th>Regulatory list</th>
<th>Notification</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>TSCA</td>
<td>Included on Inventory.</td>
</tr>
<tr>
<td>EU</td>
<td>EINECS</td>
<td>Included on EINECS Inventory or polymer substance, monomers included on EINECS inventory or no longer polymer.</td>
</tr>
<tr>
<td>Canada</td>
<td>DSL</td>
<td>Included on Inventory.</td>
</tr>
<tr>
<td>Australia</td>
<td>ACS</td>
<td>Included on Inventory.</td>
</tr>
<tr>
<td>Japan</td>
<td>ENCS</td>
<td>Included on Inventory.</td>
</tr>
<tr>
<td>South Korea</td>
<td>ECL</td>
<td>Included on Inventory.</td>
</tr>
<tr>
<td>China</td>
<td>SEPA</td>
<td>Included on Inventory.</td>
</tr>
<tr>
<td>Philippines</td>
<td>HILCO</td>
<td>Included on Inventory.</td>
</tr>
</tbody>
</table>

SARA

Section 355 (extremely hazardous substances): None of the ingredients is listed.

Section 313 (specific toxic chemical listings): Component(s) above ‘de minimus’ level: Phenol, 4,4’-(1-methylethylidene)bis-

TSCA (Toxic Substances Control Act):
At the ingredients are listed.

Proposition 65 (California):
Chemicals known to cause cancer or reproductive toxicity: Phenol, 4,4’-(1-methylethylidene)bis-

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

Abbreviation and acronyms:
ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
GHS: Globally Harmonized System of Classification and Labeling of Chemicals
ACGIH: American Conference of Governmental Industrial Hygienists.
EINECS: European Inventory of Existing Commercial Chemical Substances
ELINCS: European List of Notified Chemical Substance
CAS: Chemical Abstracts Service (division of the American Chemical Society)
HMIS: Hazardous Materials Identification System (USA)
WHMIS: Workplace Hazardous Materials Information System (Canada)
1 Identification of the substance/mixture and the company/undertaking

1.1 Product identifier
Trade name: Armor-Hard (Part C)

1.2 Application of the substance / the mixture: Epoxy Filler

1.3 Details of the supplier of the Safety Data Sheet
Manufacturer/Supplier: Metzger/McGuire Co.
P.O. Box 2217
Concord, NH 03302
Telephone: (800) 223-6680

1.4 Emergency telephone number: (800) 255-3924, +1 (813) 248-0585

2 Hazards identification

2.1 GHS Classification of the substance or mixture
Category 1A Carcinogen
Category 1 Specific Target Organ Toxicity (STOT) following repeated exposures
Category 2B Eye Irritation

2.2 GHS Label elements
Hazard pictograms/symbols

Signal word: Danger

Hazard statements:
H320: Causes eye irritation
H372: Causes damage to lungs, kidneys and autoimmune system through prolonged or repeated exposure by inhalation.
H350: May cause cancer by inhalation

Precautionary Statements:
P202: Do not handle until all safety precautions have been read and understood.
P260: Do not breathe dust.
P264: Wash hands thoroughly after handling.
P270: Do not eat, drink or smoke when using this product.
P281: Use personal protective equipment as required.
P305+P351+P338 : IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308+P313 : IF exposed or concerned: Get medical advice/attention.
P365+P366 : IF INHALED: Movevictim to fresh air. If notimprove, give artificial respiration as needed. If not improving, seekmedical attention.
P337+P313 : IF skin contact occurs: Remove from skin with plenty of water. Consultdoctor/healthcare worker.
P370+P034 : IF on clothing: Remove clothing. Wash hands before eating, drinking, or smoking.

3 Composition/information on ingredients

3.2 Mixture
Description: Substance listed below with potential nonhazardous additions.

Dangerous components:

<table>
<thead>
<tr>
<th>CAS</th>
<th>Substance</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>14838-01-7</td>
<td>Silica, Quartz, SiO2</td>
<td>80-100%</td>
</tr>
</tbody>
</table>

4 First aid measures

4.1 Description of first aid measures
After inhalation: If gross inhalation of silica occurs, remove the person to fresh air, perform artificial respiration as needed and obtain medical attention as needed.

After skin contact: If abrasion occurs wash with soap and water and seek medical attention if irritation persists or develops later.

After eye contact: Immediately wash the eye with plenty of water for at least 15 minutes, while holding eyelid(s) open. If irritation persists, seek medical attention.

After ingestion: If gastrointestinal discomfort occurs, give a large quantity of water. Never attempt to make an unconscious person drink or vomit. Seek medical attention.

4.2 Most important symptoms and effects, both acute and delayed:
There are generally no signs or symptoms of exposure to crystalline silica (quartz). Often, chronic silicosis has no symptoms. The symptoms of chronic silicosis, if present, are shortness of breath, wheezing, cough and sputum production. The symptoms of acute silicosis which can occur with exposures to very high concentrations of respirable crystalline silica over a very short time period, sometimes as short as 6 months, are the same as those associated with chronic silicosis; additionally, weight loss and fever may also occur. The symptoms of scleroderma, an autoimmune disease, include thickening and stiffness of the skin, particularly in the fingers, shortness of breath, difficulty swallowing and joint problems.

4.3 Indication of any immediate medical attention and special treatment needed: No information.

5 Firefighting measures

5.1 Extinguishing Media: Compatible with all media; use the medium appropriate to the surrounding fire.
Unusual Fire and Explosion Habits: None known.
Special Fire Fighting Procedures: None known.
Hazardous Combustion Products: None known.

6 Accidental release measures

Wear appropriate personal protective equipment. Ensure appropriate respirators are worn during and following clean up or whenever airborne dust is present to ensure worker exposures remain below occupational exposure limits (Refer to Section 8). Follow respiratory protection selection guidelines as described in Section 8 of this document.

Collect the material using a method that does not produce dust such as a High-Efficiency Particulate Air (HEPA) vacuum or thoroughly wetting down the silica-containing dust before cleaning up. Place the silica-containing dust in a covered container appropriate for disposal. Dispose of the silica-containing dust according to federal, state and local regulations.

This product is not subject to the reporting requirements of Title III of SARA, 1986, and 40 CFR 372.

7 Handling and storage

Do not breathe dust, which may be created during the handling of this product. Do not rely on vision to determine whether respirable silica is present in the air, as it may be present without a visible cloud. Use good housekeeping procedures to prevent the accumulation of silica dust in the workplace. Avoid the creation of respirable dust.

Use adequate ventilation and dust collection equipment. Ensure that the dust collection system is adequate to reduce airborne dust levels to below the appropriate occupational exposure limits. If the airborne dust levels are above the appropriate occupational exposure limits, use respiratory protection during the establishment of engineering controls. Refer to Section B - Exposure Controls/Personal Protection for further information.

In accordance with OSHA’s Hazard Communication Standard (29 CFR 1910.1200, 1915.99, 1917.28, 1918.90, 1926.59, 1928.21), state, and/or local right-to-know laws and regulations, familiarize your employees with this SDS and the information contained herein. Warn your employees, your customers and other third parties (in case of resale or distribution to others) of the potential health risks associated with the use of this product and train them in the appropriate use of personal protective equipment and engineering controls, which will reduce their risks of exposure.

See also ASTM International standard practice E 1132-06, "Standard Practice for Health Requirements Relating to Occupational Exposure to Respirable Crystalline Silica."
8 Control parameters

8.1 Occupational Exposure Limits (respirable fraction) in air for dust containing crystalline silica (quartz):

<table>
<thead>
<tr>
<th>Exposure Limit</th>
<th>Standard</th>
<th>Exposure Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSHA/OSHA PEL* (8-Hour Time-Weighted Average)</td>
<td>10 mg/m³ % SiO₂*2</td>
<td>0.025 mg/m³</td>
</tr>
<tr>
<td>ACGIH TLV* (8-Hour Time-Weighted Average)</td>
<td>5 mg/m³</td>
<td>0.05 mg/m³</td>
</tr>
<tr>
<td>NIOSH PEL (10-Hour Time-Weighted Average, 40-hour work week)</td>
<td>3 mg/m³</td>
<td>0.05 mg/m³</td>
</tr>
</tbody>
</table>

* The OSHA/MSHA PEL for dust containing crystalline silica (quartz) is based on the silica content of the respirable dust sample. The OSHA/MSHA PEL for crystalline silica as tridymite and cristobalite is one-half the PEL for crystalline silica (quartz).

8.2 Engineering controls

Respiratory protection:

- Hand/Skin protection:
- Eye protection:
  - Safety glasses with side shields should be worn as minimum protection. Dust goggles should be worn when excessively (visible) dusty conditions are present or are anticipated. There is a potential for severe eye irritation for those wearing contact lenses.

General Hygiene Considerations: There are no known hazards associated with this material when used as recommended. Following the guidelines in this SDS is recognized as good industrial hygiene practice. Avoid breathing dust. Wash dust-exposed skin with soap and water before eating, drinking, smoking, and using toilet facilities.

9 Physical and chemical properties

9.1 Information on basic physical and chemical properties

General Information

Appearance: Gray
Colour: None
Odour: Granular Solid

9.2 Melting point/range:

<table>
<thead>
<tr>
<th>Melting point/range</th>
<th>Exposure Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;1000 °C</td>
<td>Not Applicable</td>
</tr>
</tbody>
</table>

9.3 Boiling point/range:

<table>
<thead>
<tr>
<th>Boiling point/range</th>
<th>Exposure Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;1000 °C</td>
<td>Not Applicable</td>
</tr>
</tbody>
</table>

9.4 Flash point:

<table>
<thead>
<tr>
<th>Flash point</th>
<th>Exposure Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>Not Applicable</td>
</tr>
</tbody>
</table>

9.5 Evaporation rate:

<table>
<thead>
<tr>
<th>Evaporation rate</th>
<th>Exposure Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>Not Applicable</td>
</tr>
</tbody>
</table>

9.6 Water:

<table>
<thead>
<tr>
<th>Water</th>
<th>Exposure Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insoluble</td>
<td>Not Applicable</td>
</tr>
</tbody>
</table>

9.7 Flammability (solid, gaseous):

<table>
<thead>
<tr>
<th>Flammability (solid, gaseous)</th>
<th>Exposure Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-combustible solid</td>
<td>Not Applicable</td>
</tr>
</tbody>
</table>

9.8 Enthalpy:

<table>
<thead>
<tr>
<th>Enthalpy</th>
<th>Exposure Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>Not Applicable</td>
</tr>
</tbody>
</table>

9.9 Inert Decomposition Products:

<table>
<thead>
<tr>
<th>Inert Decomposition Products</th>
<th>Exposure Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silicon tetrafluoride</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

9.10 Relative Density at 20°C:

<table>
<thead>
<tr>
<th>Relative Density at 20°C</th>
<th>Exposure Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.65g/cm³</td>
<td>Not Applicable</td>
</tr>
</tbody>
</table>

9.11 Solubility in / Miscibility with:

<table>
<thead>
<tr>
<th>Solubility in / Miscibility with</th>
<th>Exposure Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>Not Applicable</td>
</tr>
</tbody>
</table>

9.12 pH:

<table>
<thead>
<tr>
<th>pH</th>
<th>Exposure Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>Not Applicable</td>
</tr>
</tbody>
</table>

9.13 Solubility:

<table>
<thead>
<tr>
<th>Solubility</th>
<th>Exposure Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>Not Applicable</td>
</tr>
</tbody>
</table>

9.14 Enthalpy of Formation:

<table>
<thead>
<tr>
<th>Enthalpy of Formation</th>
<th>Exposure Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>Not Applicable</td>
</tr>
</tbody>
</table>

9.15 Odour threshold:

<table>
<thead>
<tr>
<th>Odour threshold</th>
<th>Exposure Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>Not Applicable</td>
</tr>
</tbody>
</table>

9.16 Viscosity:

<table>
<thead>
<tr>
<th>Viscosity</th>
<th>Exposure Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>Not Applicable</td>
</tr>
</tbody>
</table>

10 Stability and reactivity

10.1 Reactivity:

- Reactivity: Reactive with strong oxidizing agents
- Chemical Stability: Stable

10.2 Thermal Stability:

- Thermal Stability: If crystalline silica (quartz) is heated to more than 870°C (1588°F), it can change to a form of crystalline silica known as tridymite, and if crystalline silica (quartz) is heated to more than 1470°C (2678°F), it can change to a form of crystalline silica known as cristobalite.

10.3 Incompatibility:

- Incompatible: Strong oxidizing agents, such as fluorine, chlorine trifluoride, hydrogen fluoride, oxygen difluoride, hydrogen peroxide, etc.; acetylene and ammonia.

10.4 Hazardous Decomposition Products:

- Hazardous Decomposition Products: Silica will dissolve in hydrofluoric acid and produce a corrosive gas – silicon tetrafluoride.

10.5 Hazardous Polymerization:

- Hazardous Polymerization: Not known to polymerize.

11 Toxicological information

CAUTION: Crystalline silica exists in several forms, the most common of which is quartz. Crystalline silica as tridymite and cristobalite are more fibrogenic than crystalline silica as quartz.

Potential Health Effects:

- Primary routes(s) of exposure: Inhalation, Skin, Ingestion

- Inhalation:
  - Acute Effects: One form of silicosis, acute silicosis, can occur with exposures to very high concentrations of respirable crystalline silica over a very short time period, sometimes as short as 6 months. The symptoms of acute silicosis include (but are not limited to) progressive shortness of breath, fever, cough and weight loss. Acute silicosis is fatal.
  - Chronic Effects: The adverse health effects – lung disease, silicosis, cancer, autoimmune disease, tuberculosis, and nephrotoxicity -- are chronic effects.

- Eye Contact: Crystalline silica (quartz) may cause abrasion of the cornea.

- Skin Contact: May cause abrasion to skin.
Medical Conditions Generally Aggravated by Exposure: The condition of individuals with lung disease (e.g., bronchitis, emphysema, chronic obstructive pulmonary disease) can be aggravated by exposure.

A. SILICOSIS

The major concern is silicosis (lung disease), caused by the inhalation and retention of respirable crystalline silica dust. Silicosis can exist in several forms, chronic (or ordinary), accelerated or acute. Chronic or Ordinary Silicosis is the most common form of silicosis and can occur after many years of exposure to levels above the occupational exposure limits for airborne respirable crystalline silica dust. It is further defined as either simple or complicated silicosis.

Simple Silicosis is characterized by lung lesions (shown as radiographic opacities) less than 1 centimeter in diameter, primarily in the upper lung zones. Often, simple silicosis is not associated with symptoms, detectable changes in lung function or disability. Simple silicosis may be progressive and may develop into complicated silicosis or progressive massive fibrosis (PMF).

Complicated Silicosis or PMF is characterized by lung lesions (shown as radiographic opacities) greater than 1 centimeter in diameter. Although there may be no symptoms associated with complicated silicosis or PMF, the symptoms, if present, are shortness of breath, wheezing, cough and sputum production. Complicated silicosis or PMF may be associated with decreased lung function and may be disabling. Advanced complicated silicosis or PMF may lead to death. Advanced complicated silicosis or PMF can result in heart disease (cor pulmonale) secondary to the lung disease.

Accelerated Silicosis can occur with exposure to high concentrations of respirable crystalline silica over a relatively short period; the lung lesions can appear within five (5) years of the initial exposure. The progression can be rapid. Accelerated silicosis is similar to chronic or ordinary silicosis, except that the lung lesions appear earlier and the progression is more rapid.

Acute Silicosis can occur with exposures to very high concentrations of respirable crystalline silica over a very short time period, sometimes as short as a few days. The symptoms of acute silicosis include progressive shortness of breath, fever, cough and weight loss. Acute silicosis is fatal.

B. CANCER

ARC - The International Agency for Research on Cancer (IARC) concluded that there is "sufficient evidence in humans for the carcinogenicity of crystalline silica in the form of quartz or cristobalite", there is "sufficient evidence in experimental animals for the carcinogenicity of quartz dust" and that there is "limited evidence in experimental animals for the carcinogenicity of tridymite dust and cristobalite dust." The overall IARC evaluation was that "crystalline silica inhaled in the form of quartz or cristobalite dust is carcinogenic to humans (Group 1)." The IARC evaluation noted that not all industrial circumstances studied evidenced carcinogenicity. The monograph also stated some inherent characteristics of the crystalline silica or on external factors affecting its biological activity or distribution of its polymorphs. For further information on the IARC evaluation, see IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, Volume 100, "Silicosis, Dust, Crystalline, in the Form of Quartz or Cristobalite"

NTP - In its Eleventh Annual Report on Carcinogens, concluded that respirable crystalline silica is known to be a human carcinogen, based on sufficient evidence of carcinogenicity from studies in humans indicating a causal relationship between exposure to respirable crystalline silica and increased lung cancer rates in workers exposed to crystalline silica dust.

OSH: - Crystalline silica is not on the OSHA carcinogen list.

C. AUTOIMMUNE DISEASES

There is evidence that exposure to respirable crystalline silica (without silicosis) or that the disease silicosis may be associated with the increased incidence of several autoimmune disorders, -- scleroderma, systemic lupus erythematosus, rheumatoid arthritis and diseases affecting the kidneys. For a review of the subject, the following may be consulted: (1) "Antinuclear Antibody and Rheumatoid Factor in Silica-Exposed Workers", Arq Hig Rada Toksikol, (60) 185-203 (2005); (2) "Occupational Exposure to Crystalline Silica and Autoimmune Disease", Environmental Health Perspectives, (107), Supplement 5, 793-802 (1999); (3) "Occupational Scleroderma", Current Opinion in Rheumatology, (11) 490-494 (1999); (4) "Connective Tissue Disease and Silicosis", Am J Ind Med, (35), 375-381 (1999).

D. TUBERCULOSIS

California Proposition 65: Respirable crystalline silica (quartz) is classified as a substance known to the state of California to be a carcinogen.

Massachusetts Toxic Use Reduction Act: Respirable crystalline silica is considered toxic per the Massachusetts Toxic Use Reduction Act.

Pennsylvania Worker and Community Right to Know Act: Quartz is considered hazardous for purposes of the Act, but it is not a special hazardous substance or an environmental hazardous substance.

15.2 Chemical Safety assessment: A Chemical Safety Assessment has not been carried out.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

**Definitions of Acronyms**

ACGIH: American Conference of Governmental Industrial Hygienists
ANSI: American National Standards Institute
APF: Assigned Protection Factor
California REL: California Inhalation Reference Exposure Limit
CAS: Chemical Abstracts Service
CCOHSA: Canadian Centre for Occupational Health and Safety
CEPA: Canadian Environmental Protection Agency
CERCLA: Comprehensive Environmental Response, Compensation and Liability Act
CPR: Controlled Products Regulation
DHHS: Department of Health and Human Services
DSL: Domestic Substances List
EEC: European Community Guidelines
EINEN: European Inventory of Existing Commercial Chemical Substances
EPA: Environmental Protection Agency
EPCRA: Emergency Planning and Community Right to Know Act
FDA: Food and Drug Administration
GHS: Globally Harmonized System
HEPA: High-Efficiency Particulate Air
IARC: International Agency for Research on Cancer
IDLH: Immediately Dangerous to Life and Health
MSHA: Mine Safety and Health Administration
NIOSH: National Institute for Occupational Safety and Health, US Department of Health and Human Services
NIOSH REL: NIOSH Recommended Exposure Limit
NPRI: National Pollutant Release Inventory
OSHA: Occupational Safety and Health Administration, US Department of Labor
PEL: Permissible Exposure Limit
PMF: Progressive Massive Fibrosis
RCRA: Resource Conservation and Recovery Act
SARA Title III: Title III of the Superfund Amendments and Reauthorization Act, 1986
SDS: Safety Data Sheet
STOT: Specific Target Organ Toxicity
TLV: Threshold Limit Value
TSCA: Toxic Substance Control Act
WHMIS: Workplace Hazardous Materials Information System